

REMARKS

1. Applicant has filed this Reply & Amendment responsive to the Office action having a mailing date of June 6, 2007 finally rejecting all of Applicant's claims.
2. Applicant notes that claim 197 has been rejected twice by the Examiner: firstly, under 35 U.S.C. 103(a) over Montgomery (US 6775221) with a general obvious comment as to the inclusion of a pump and secondly under the Examiner's rejection of claims 189 and 197 under 35 U.S.C. 103(A) over Montgomery in view of Bingler (US 6668911). Since claim 197 has the "direct exposure" element (i.e. the coolant in direct contact with the heat generating components), Applicant notes the first rejection of claim 197 above is incorrect and non-supportable by the Examiner's own admission.
3. Applicant further points that claim 217 has been erroneously rejected the Examiner as described below in paragraph 27. As a result, claim 217 currently stands as not being rejected properly.

Rejection of Claims 186-188 and 190-197 under 35 USC §103(a) over Montgomery

4. In Paragraph 2 of the Examiner's Office Action of June 6, 2007, the above claims have been rejected by the Examiner under 35 U.S.C. 103(a) as being unpatentable over Montgomery et al." Later the Examiner adds that "Montgomery discloses the claim invention except forced circulation in accelerated rate. It would have been obvious ...to provide forced circulation...buy installing a circulation pump, such modification is widely implemented in the industry..."
5. Applicant does not dispute that circulation pumps are widely known. However, Applicant disputes the Examiner's statement that "...such modification (to Montgomery) is widely known..." This statement is unsupportable. As previously pointed out, Montgomery discloses a liquid-to-vapor-to-liquid based cooling system that solely relies on convective circulation of the vapor for circulation of the coolant. (See column 3 of Montgomery starting at line 40.) How can it be obvious to employ a circulation pump for "forced" circulation in a system specifically designed for "convective circulation"

and, hence, designed not to use a (forced circulation) pump? Applicant again submits that its depiction of its system as a “forced circulation” system clearly distinguishes it over Montgomery.

6. As previously noted by Applicant, Montgomery is a completely different kind of cooling system than Applicant’s invention. Applicant submits that, by defining its cooling system as “a forced circulation cooling system,” it clearly distinguished its claims over Montgomery. Montgomery is a “convective circulation” system, not a forced circulation system.

7. The above notwithstanding, Applicant has again amended independent claims 186 and 194. In the amended independent claims 186 and 194 in this Reply and Amendment, Applicant describes a forced circulation liquid cooling system which, except for the specific elimination of a “reservoir” has been known for many years. (Montgomery is not one of these types of systems.) In all that time, no one that Applicant is aware of, has developed such a system without having a reservoir. It cannot have been obvious to eliminate the reservoir if, for so long, no one has done so. Applicant has previously described the many benefits derived from eliminating the “reservoir” in these forced circulation, liquid cooling systems. Montgomery is a convective circulation system and, consequently, Applicant submits that, one skilled in the art of forced circulation systems would not look to Montgomery for improvements to the coolant circulation system in a forced circulation system.

8. Also, in claims 186 and 194, Applicant has made it clear that the coolant remains in liquid state at all times by referring to the coolant throughout as “liquid coolant”. Montgomery is a liquid-to-vapor-to-liquid system specifically designed to use convective circulation of vapors (as opposed to forced circulation of liquid) as a means of coolant circulation.

9. A system such as Applicant’s is designed for aggressive cooling performance. This is primarily achieved by accelerated flow rates of the (liquid) coolant through the system. Applicant’s invention of eliminating the reservoir in “forced circulation” systems is significant. Montgomery is a “convective circulation” system designed to be inexpensive and space conservative, but not for aggressive cooling performance. One skilled in the art of (powerful) “forced circulation” liquid cooling systems would not

look to a system such as Montgomery's because it is a "convective circulation" system and cannot be used for the aggressive cooling performance of (an all liquid state) forced circulation cooling system.

10. Claims 187-189 and 195-197 have also been amended herein so that they are consistent with the amended independent claims 186 and 194, respectively.

11. Applicant submits that, in view of its remarks above and, given its amendments to independent claims 186 and 194 herein, it has overcome the Examiner's rejection above of claims 186 and 194 and all claims which depend directly or indirectly thereon and that these claims are in condition for allowance.

Rejection of Claims 189 and 197 under 35 USC §103(a) over Montgomery in view of Bingler

12. In paragraph 3 of the Examiner's Office Action of June 6, 2007, the claims 189 and 197 have been rejected by the Examiner under 35 U.S.C. 103(a) as being unpatentable over Montgomery in view of Bingler (US 6668911). Applicant submits that, since these claims are dependent on claims 186 and 194, respectively and that the rejection of claims 186 and 194 have been overcome above, the rejection of claims 189 and 197 is similarly overcome and that these claims are in condition for allowance.

Rejection of Claims 198, 199, 208-213, 214 and 215 under 35 USC §103(a) over Kang

13. In paragraph 4 of the Examiner's Office Action of June 6, 2007, the above claims have been rejected by the Examiner under 35 U.S.C. 103(a) as being unpatentable over Kang (US 6142222). The Examiner has repeated his rejection, word for word, from the previous Office Action without any mention of Applicant's Remarks to the Examiner's previous rejection of these claims over Kang.

14. Applicant again submits that its independent claims 198 and 214 are not anticipated by Kang nor would Applicant's invention would be obvious in view of Kang. Applicant's claims 198 and 214

claim an entire “cooling system having no component acting as a reservoir while the cooling system is in operation” as opposed to a heat exchange unit having no component acting as a reservoir...

With respect to Applicant’s claimed invention, Kang, at most, stands for a heat exchange unit (not a cooling system) having no component acting as a reservoir while the cooling system is in operation. No one skilled in the art could/would deduce that, because the Kang heat exchange unit has no component acting as a reservoir while the system is in operation.

15. At all times, Applicant has, in independent claims 198 and 214, distinguished between a cooling system and a heat exchange unit (a component in the cooling system) and has claimed at all times “...wherein the cooling system (not the heat exchange unit) has no component acting as a reservoir...”

16. By analogy, the Examiner’s argument is the equivalent of saying that, in an automobile cooling system, the radiator is the entire cooling system and because the radiator has no coolant reservoir, the entire cooling system does not have one. Yet, automobile cooling systems do have reservoirs for coolant.

17. In paragraph 4, the Examiner repeatedly refers to Kang as a “cooling system” (i.e. “...Kang discloses the cooling system having a heat exchange unit, ...” and “...the cooling system has no component acting as a reservoir while the cooling system is in operation...”.) Kang is not a cooling system nor does it disclose a cooling system. Throughout Kang and even in the title, Kang is referred to as a heat exchanger. Kang discloses a heat exchange unit which is a component in a cooling system. Kang is very specifically limited to the construction of the heat exchange unit with regard to its thermal dissipation capability. Kang is silent about the method of circulation of coolant through the entire cooling system (of which it is just a component).

18. It is obvious to anyone skilled in the art that a cooling system and a heat exchange unit are not one in the same. The words are different and they convey plainly different meanings. The Examiner cannot just redefine Kang (a heat exchange unit) into an entire cooling system.

19. The above notwithstanding, Applicant has amended claims 198 and 214 so that, in the preamble, cooling system is specifically defined in the preamble as to its component parts and one of the component parts is a heat exchange unit.

20. Applicant has also amended claims 200-202 and 216-217 herein to make them consistent with the amendments to independent claims 198 and 214, respectively.

21. In the view the remarks above and Applicant's amendment herein, Applicant submits that the rejection of claims 198-199, 208-213 and 214-215 over Kang is overcome and that these claims are now in condition for allowance.

Rejection of Claims 214-207 under 35 USC §103(a) over Kang in view of Roy

22. In paragraph 5 of the Examiner's Office Action of June 6, 2007, the above claims have been rejected by the Examiner under 35 U.S.C. 103(a) as being unpatentable over Kang in view of Roy (US 6408937).

23. Applicant has previously explained in its previous Remarks that Roy is a heat pipe and not of the same type as Applicant's system. A key difference between Applicant's invention and Roy (and other heat pipe systems), is that the dissipation of heat occurs remotely from the heat-generating components in addition to being significantly more powerful cooling system (than heat pipes).

24. The Examiner has stated that "...Roy discloses the self-priming pump is disclosed in the heat exchanger; the pump is disclosed in the output cavity 20..." Roy defines item 20 as an "impeller chamber". Item 40 in Roy is defined as the "heat dissipation device." Roy clearly depicts and describes the impeller chamber 20 and the heat dissipation device 40 as separate components. If the Examiner is going to liken Roy to Applicant's invention, then Roy's heat dissipation device 40 is the heat exchange

unit and the impeller chamber 20 is not an output cavity of the heat exchanger and the pump in Roy is not disposed in the heat exchanger as claimed by the Examiner.

25. Consequently, Applicant submits that, given the arguments above, Applicant has overcome the Examiner's rejection of claims 200-207. Moreover, since the Applicant has overcome the rejection of claim 198 on which claims 200-207 directly or indirectly depend, Applicant submits this rejection of claims 200-207 is also overcome.

Rejection of Claims 216 and 217 under 35 USC §103(a) over Kang in view of Bingler

26. In paragraph 6 of the Examiner's Office Action of June 6, 2007, the above claims have been rejected by the Examiner under 35 U.S.C. 103(a) as being unpatentable over Kang in view of Bingler.

27. The Examiner's rejection of Claim 217, by his own admission, here is clearly erroneous. Claim 217 relates to positioning the inlet of a heat transfer unit (not a heat exchange unit) below the outlet of the heat transfer unit to enhance convective circulation of the coolant in addition to the forced circulation. Kang only discloses a heat exchange unit and does not disclose or discuss a heat transfer unit. Bingler has been cited by the Examiner only for what is called direct exposure of the coolant to the heat generating unit in the heat transfer unit. Moreover, in all embodiments of Bingler, the inlets and outlets of the heat transfer unit are shown at the same level or height. Consequently, the Examiner's rejection of claim 217 in paragraph 6 of the June 6, 2007 Office Action is erroneous and without support.

28. Notwithstanding the preceding paragraph, Applicant submits that, since these claims 216 and 217 are dependent on claim 214 and since Applicant has overcome the rejection of claim 214 herein, the rejection of claims 216 and 217 is similarly overcome and that these claims are in condition for allowance.

Conclusion

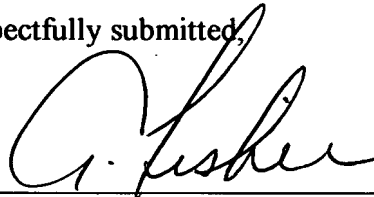
29. Applicant submits that in view of its remarks above and the amendments to the claims made herein, it has overcome all of the Examiner's rejections of all claims and that the claims are in condition for allowance.

Should there be any further comments or issues; the Applicant respectfully invites contact of the undersigned at the telephone number indicated below or at art.fisher@patentdominion.com.

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Respectfully submitted,



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